

Delayed Films in Bronchography

A Preliminary Report

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A 68-YEAR-OLD MAN, with a history of cough and expectoration, came to the Department of Radiology for bronchography in the fall of 1948. The technician did a poor job on the first films, so they were retaken 45 minutes later. Although the patient had coughed up some of the oil and driven some into the alveoli, normal bronchial branches were now demonstrated in the lingula, which before had not been filled. Thereafter, delayed films were tried on many patients.

Method

After postural drainage and local anesthesia, a flexible rubber catheter was passed into one or the other main bronchus and iodized oil injected, the patient being turned so that it ran into the lung in question. If injection of the other lung was also desired, it was done at a second visit. Prone or supine spot films were obtained, and then films were exposed with the patient sitting or standing. Thereafter, he was permitted to cough and talk. Thirty to 60 minutes later films were again exposed in the same position and projection as the first films.

Analysis

In each case, and separately for each lobe filled, the delayed film was compared with the immediate film and the results tabulated as: bronchi better demonstrated, bronchi less well demonstrated, bronchiectasis better demonstrated, oil in the alveoli, etc. To be recorded as satisfactorily filled, all segmental branches had to be traceable out to the periphery.

Results

The most satisfactory interval between immediate and delayed films was 30 minutes. The delayed films proved to be of value in one-third of the examinations. In some cases bronchiectasis not demonstrable on the immediate films was definitely diagnosed on the delayed films. In other cases a significantly better demonstration of branch bronchi in the delayed films permitted definite exclusion of bronchiectasis. Among cases in which the delayed films were re-

• In bronchography, the oil often does not fill all bronchial branches. Films taken 30 to 60 minutes later frequently complete the opacification of bronchi in lingula, middle lobe and lower lobes. Such delayed films may demonstrate bronchiectasis not shown initially, or may exclude bronchiectasis suspected on the first films.

corded as of no value (two-thirds of the examinations) were many in which the filling was entirely satisfactory on the immediate films. Delayed films were taken in those cases for the purpose of the investigation. In about half of them the lower lobe and middle lobe or lingula were still well filled at 30 minutes, but in very few was the original good filling of the upper lobes maintained. There was one case, however, in which the delayed film established the diagnosis of bronchiectasis in the right upper lobe.

The delayed films were most often of value when the disease was in the middle lobe. Figure 1 illustrates such a case. The patient, a 68-year-old woman, had been in the hospital many times since 1942 with productive cough, usually diagnosed as owing to bronchitis. She had many bouts of malaise and fatigue, usually accompanying upper respiratory tract infections. Results of physical examination were within normal limits in 1950 when bronchograms were made. Early filling was good except for the middle lobe. The delayed film showed marked saccular bronchiectasis there, with partial atelectasis. The middle lobe was resected and the diagnosis confirmed.

Success of delayed films in excluding disease is illustrated in Figure 2. A 46-year-old woman had coughed for many years, raising thick yellow sputum, occasionally blood-tinged. She complained of dull aching in the chest. No abnormalities were observed in a physical examination. Bronchography showed excellent filling of all branches in the right lung, except the posterior basal. The proximal portions of these, where they were filled, appeared irregular, and bronchiectasis was suspected. The delayed films showed normal tapering of these posterior

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branches and showed the suspicion to have been unwarranted.

Figure 3 demonstrates the improvement of filling to give a definite diagnosis. A 52-year-old man had cough that had gradually increased for five years. A cup or two of purulent sputum was raised daily. In the initial bronchogram there was some apparent pooling. The delayed films showed clearly the severity and extent of the bronchiectasis in the left lower lobe.

These preliminary studies show that delayed films may be of great value in some cases. Their primary purpose should not be to compensate for lack of care in the original examination. Every effort should be made to get complete filling of all lobes and segments (of the chosen side). Postural drainage beforehand, adequate anesthesia, the use of limited quantities of oil, care as to position and fluoroscopic control of the injection—all are essential in the technique of bronchography. There are cases, however,

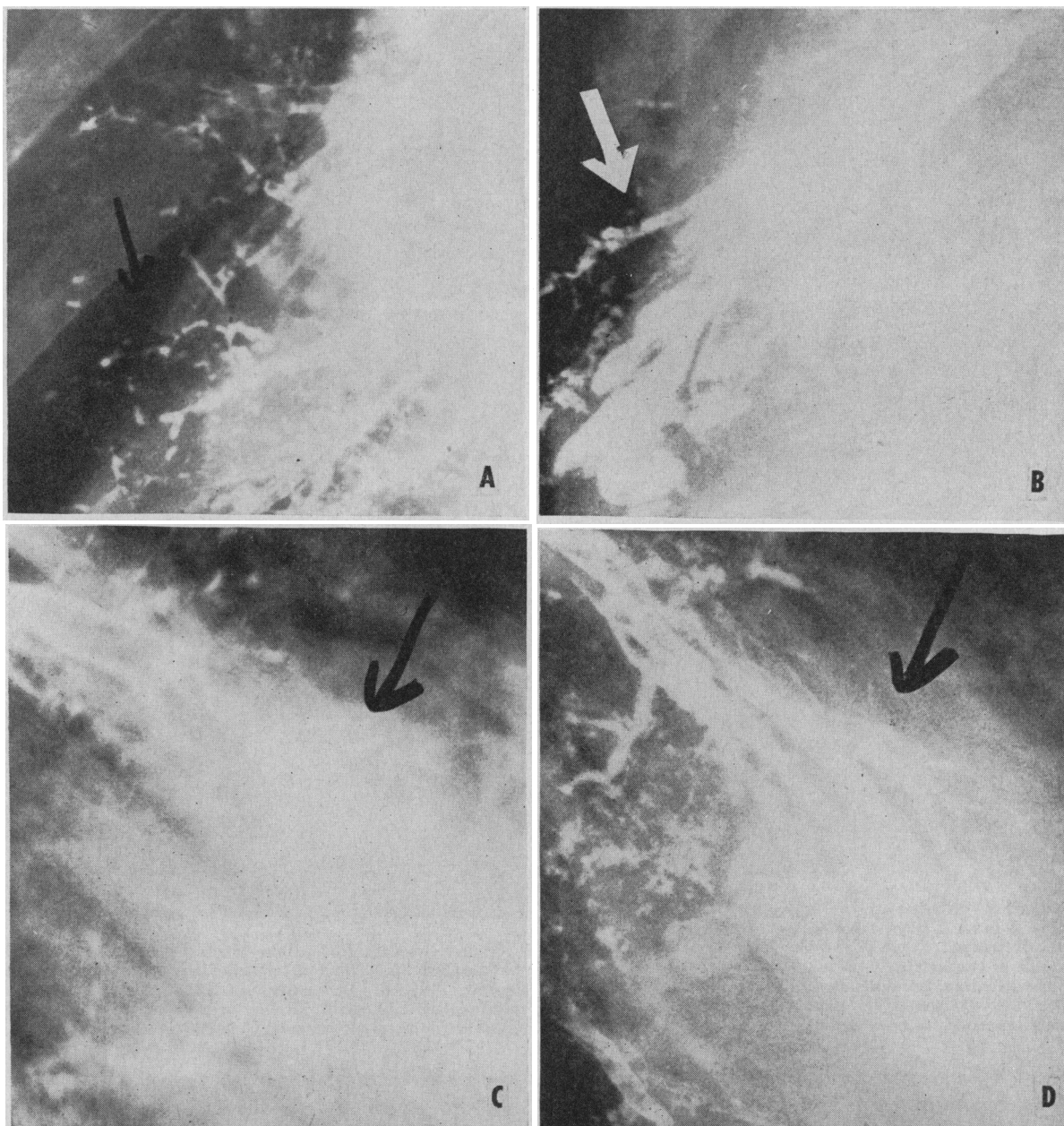


Figure 1.—Right middle lobe. Bronchiectasis established by delayed films. *a*, Left anterior oblique, original. *b*, Left anterior oblique, delayed. *c*, Right lateral, original. *d*, Right lateral, delayed. On the original films, the right middle lobe branches did not fill. The delayed films demonstrated marked bronchiectasis with partial collapse as evidenced by the clumping of the branches. The findings were confirmed at operation.

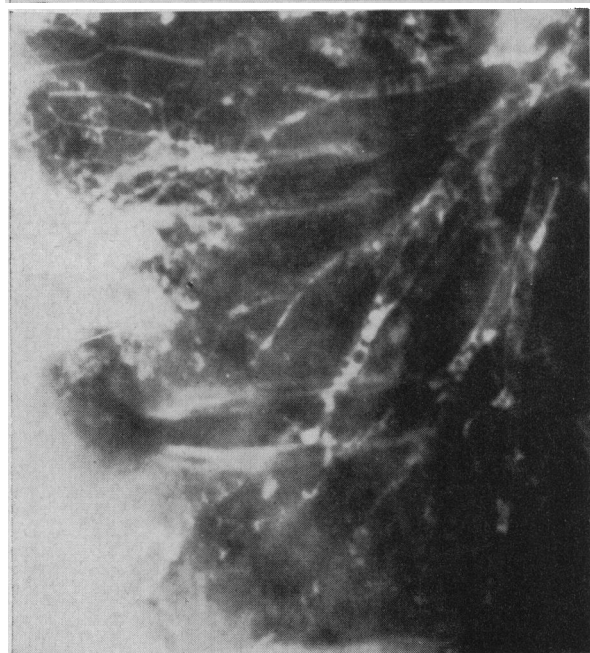
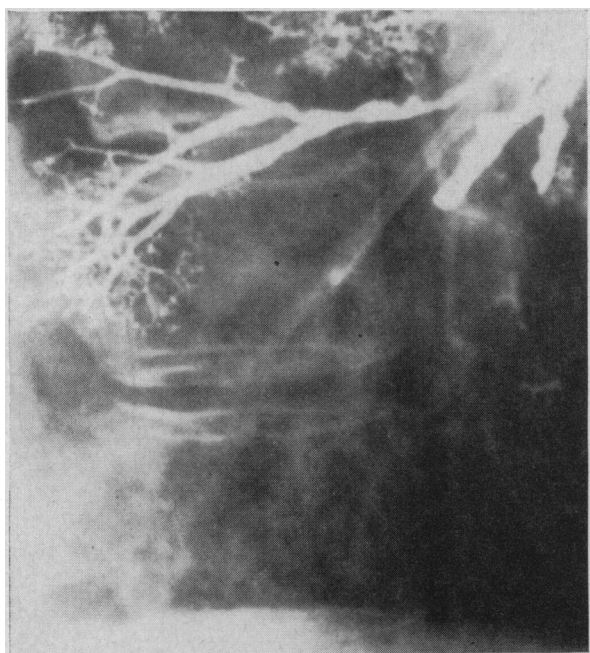


Figure 2.—Right lower lobe. Bronchiectasis excluded by delayed films. *Upper*, right lateral, original. *Lower*, right lateral, delayed. Some of the posterior basal segments did not fill in the original studies. The irregularity of outline of the proximal portions of these bronchi was considered suggestive of bronchiectasis. Delayed films showed normally tapering posterior basal branches.

in which the greatest care still gives only incomplete filling. Spasm of major bronchi and the presence of viscid secretions in them are probably the most frequent reasons for this. It is in such cases that taking delayed films may spare the patient a repetition of the oil injection. The patient's talking and coughing

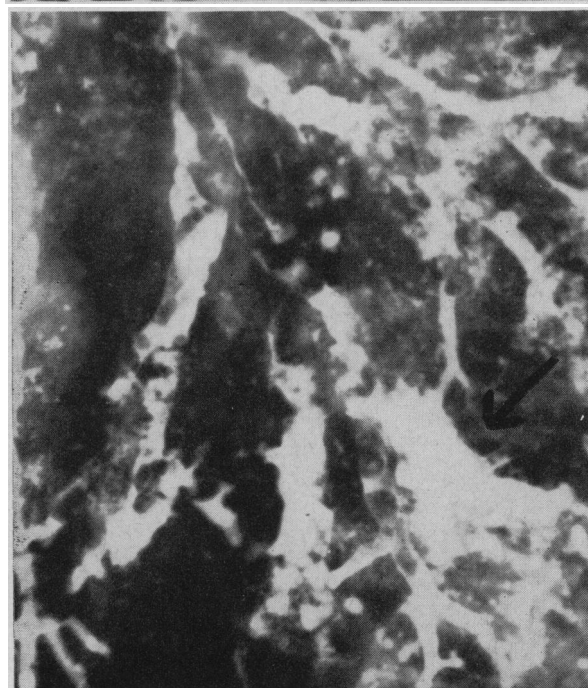
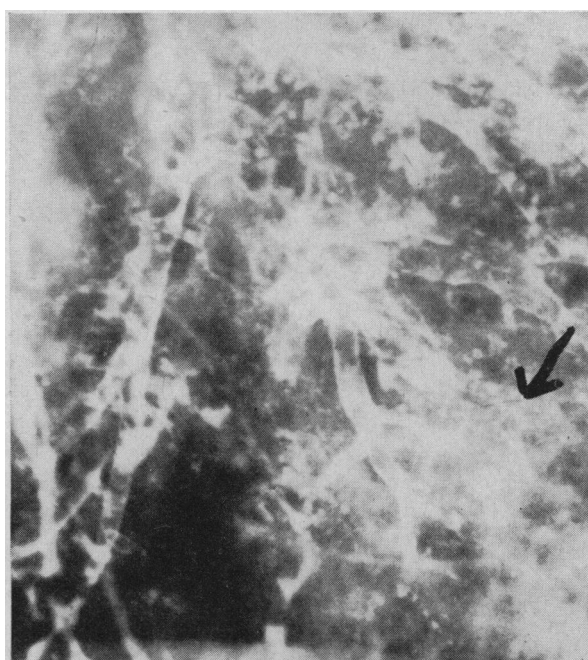


Figure 3.—Left lower lobe. Bronchiectasis established by delayed films. *Upper*, left lateral original. *Lower*, left lateral, delayed. Bronchiectasis was only suggested by pooling of Lipiodol® in the original studies. Delayed films demonstrated extensive bronchiectatic change.

in the interval may remove some oil and drive some into the alveoli, but the delayed film may still be useful. There is no reason to make delayed films when the first ones show complete filling of all branches under study.

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